ISG233/01 - MARKET INDEX DEFINITION STATEMENT REVIEW 2020

MEETING NAME	Imbalance Settlement Group

Date of meeting	1 September 2020
Paper number	233/01
Owner/author	Nick Baker
Purpose of paper	For Decision
Classification	Public
Summary	The Market Index Definition Statement (MIDS) defines the way the Market Index Price (MIP) is calculated. On behalf of the Panel, we review the MIDS annually, as required by the Balancing Settlement Code (BSC).

Our analysis shows that the current Individual Liquidity Threshold (ILT), timeband weightings and product weightings remain suitable for 2020/21.

We invite the Imbalance Settlement Group (ISG) to note the analysis and to approve the consultation questions provided in the attachment to this paper. |

1. Executive Summary

1.1 Elexon reviews the Market Index Definition Statement (MIDS)[1] annually on behalf of the BSC Panel in accordance with BSC Section T1.5.4. In this review, the analysis covers the period 1 August 2019 to 31 July 2020. The review is undertaken to ensure that parameters used in the MIDS calculations (i.e. the Individual Liquidity Threshold (ILT), timeband weightings and product weightings) remain fit for purpose and through the parameters, checking the MIDS principles (BSC Section T1.5.3) are being met.

1.2 The Market Index Price (MIP) is calculated for every Settlement Period as defined in the MIDS. It is reported to industry for information and used in the calculation of System Prices in defined scenarios, more information on when it is used in the calculation is given in Section 2 of Appendix 1.

1.3 To comply with European Balancing Guideline, from 15 January 2021, the MIP cannot be used as a component of the System Price calculation, and will be replaced by the Value of Avoided Activation of Balancing Energy (VOAA). BSC Modification P410 'Changing imbalance price calculations to comply with the Imbalance Settlement Harmonisation regulations' has been raised to address this.

1.4 As part of the BSC Modification P410 workgroup, the future of the MIDS will be determined, including whether the requirement for an annual review of the MIDS (in accordance with BSC Section T1.5.4) remains valid.

1.5 Following the 2018 MIDS review, BSC Modification P377 amended the description of the timebands in the MIDS and removed timeband 6 as a weighted product in Market Index Data (MID). BSC Modification P377 was implemented on 18 April 2019. In this review, analysis covers the period 1 August 2019 to 31 July 2020, which represents the first full MIDS review period following the P377 changes.

1.6 The 2020 MIDS review indicates that the current ILT, timeband weightings and product weightings remain suitable. Therefore our preliminary recommendations are not to change the parameters.

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[1] The MIDS can be found on the Imbalance Pricing page on the ELEXON website:
https://www.elexon.co.uk/operations-settlement/imbalance-pricing/

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1.7   We use Market Index Base Data (MIBD) to review the performance of the parameters in accordance with the principles defined in the MIDS. The data details individual trades on the two power exchanges[2] which act as Market Index Data Providers (MIDPs).

1.8   Our detailed analysis is provided in Appendix 1 to this paper. In summary, our key findings are:

- **Volume**: The daily average MIV (the traded volume across weighted timebands and products[3]) was 1,109MWh in the 2019/20 review period. This is 96MWh higher than the daily average MIV of 1,013MWh between 18 April and 31 July 2019 in the last review period following the implementation of P377. See Appendix 1, Section 3 for more information.

- **Individual Liquidity Threshold (ILT)**: The current 25MWh threshold remains suitable for both MIDPs. There were 21 Settlement Periods (0.12%) in the current review for EPEX SPOT where the MIP and MIV were defaulted to zero. For 14 of these 22 Settlement Periods, no data was received from the MIDP. For Nord Pool, 17,438 Settlement Periods (99.26%) had the MIP and MIV defaulted to zero in the 2019/20 review period. For 17,392 of these Settlement Periods, there were no qualifying trades as part of the Market Index Base Data. See Appendix 1, Section 4 for more information.

- **Weighting values**: The weightings are applied to determine which products and timebands are included, and to what extent, in the MIP calculation. Currently, the MIDS defines the use of either '1' or '0' weights, where '1' results in the data being fully included and '0' fully excluded.

  - **Timebands**: The current '1' weighting of timebands 1 to 5 includes all trades within eight hours of the Submission Deadline. The analysis indicates that the current timebands are suitable.

  - **Products**: The weighted products are those of half hour, 1 hour, 2 hour and 4 hour duration. The analysis indicates that the current product weighting remain suitable in accordance with the MIDS principles.

1.9   The 2019 MIDS Review assessed whether the changes as part of BSC Modification P377 have delivered the expected benefits of ensuring that there was increased liquidity in the MID, and that a reflective MIP is calculated based on the short term market. This review, the first full MIDS Review period following the changes continues to show that trades used to calculate the MIP are closer to real time, and that the changes to timebands have meant that the daily average MIV has increased since before P377.

1.10   The detail of our review is set out in Appendix 1 – Market Index Base Data Analysis

2.   Next steps

2.1   The ISG reviews, consults and makes recommendations to the Panel on the MIDS at least annually in accordance with the BSC. Following the ISG meeting we will publish a consultation on this review. The draft consultation proforma included in Attachment A will be sent out along with the analysis included in Appendix 1. We invite you to agree on the questions, suggest any additional questions and provide comments on the analysis in this paper.

2.2   As this paper recommends no changes to the MIDS, in line with last year's review timescales, we recommend a consultation period of two weeks. Should the ISG agree, the responses will be presented to the ISG at its October 2020 meeting. We will then invite you to consider the responses and make a final recommendation to the BSC Panel for its November 2020 meeting.

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[2] EPEX SPOT and Nord Pool

[3] A qualifying product is a product which is traded on the spot market in the short term and which is eligible for inclusion in the Market Index Data calculation

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3. Recommendations

3.1 We invite you to:

    a) **NOTE** the analysis presented in this paper;

    b) **APPROVE** the consultation questions provided in Attachment A of this paper, and suggest any additional questions; and

    c) **COMMENT** on the analysis in this paper which we will present in our industry consultation.

Appendices

Appendix 1 – Market Index Base Data Analysis

Attachments

Attachment A – Consultation Proforma

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APPENDIX 1 - MARKET INDEX BASE DATA ANALYSIS

Section 1 - Background Information

- Definitions for the terms used in the review

Section 2 – Use of the Market Index Price (MIP)

- Analysis of the use of the MIP

Section 3 - Analysis of the Market Index Volume (MIV)

- An overview of average MIV by Settlement Date

- An overview of average MIV by timebands/products across Settlement Periods

Section 4 - Analysis of the Individual Liquidity Threshold (ILT)

- Principles to be applied to ILT

- Number of defaults in the review period

- Analysis of suitability for the current ILT

Section 5 - Analysis of the timeband and product Weightings

- Principles to be applied to timeband and product weightings

- Analysis of the current product and timeband weightings

Section 6 - Analysis All Products and timebands

- Analysis of all timebands and products for potential changes on the current weightings

- Analysis of the Day Ahead Auction Product

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1. Background Information

1.1 Each year, Elexon reviews the Market Index Definition Statement (MIDS) on behalf of the BSC Panel in accordance with BSC Section T1.5.4. In this review, the analysis covers the period 1 August 2019 to 31 July 2020. The review consists of checking that parameters used in the Market Index Price (MIP) calculation defined in the MIDS (i.e. the Individual Liquidity Threshold (ILT), timeband weightings and product weightings) remain fit for purpose and through the parameters, checking the MIDS principles are being met (BSC Section T1.5.3). The purpose of the MIP is to reflect the price of wholesale electricity in Great Britain in the short term market, for delivery in respect of that Settlement Period.

1.2 Parties trade wholesale energy on power exchanges where they can buy and sell power exchange products. The products vary by duration and start time. Approved Modification Proposal P78 introduced the MIP to reflect the price of wholesale electricity in the short term market for Great Britain.

1.3 A power exchange can provide data through its role as a Market Index Data Provider (MIDP). As a MIDP they calculate Market Index Data (MID), which consists of half hourly prices and volumes. The calculation process is defined in the MIDS. In particular, the Market Index Definition Statement defines:

- The overall price (Market Index Price or MIP) and volume (Market Index Volume or MIV) calculation process;

- A volume threshold (Individual Liquidity Threshold or ILT), below which the default rules are applied;

- A list of power exchange products that are included in the calculation;

- A list of timebands which group trades according to how long before the Submission Deadline they are made;

- Weightings which reflect the importance of the products and timebands; and

- Principles by which the weightings, products and thresholds are determined.

1.4 The Individual Liquidity Threshold (ILT) is a volume threshold that is set to apply default rules (see 1.5) when there is insufficient trading on the power exchange to provide a suitable price. The aim is to avoid the price being set by a single trade (i.e. not setting the ILT too low), and to minimise the number of Settlement Periods where the default rule is applied (i.e. not setting the ILT too high).

1.5 The Market Index Volume (MIV) is calculated as the sum of the traded volume across the selected products and timebands, as defined in the MIDS. When the MIV traded in a half-hour is greater than the ILT, the MIP is the volume weighted average price of the trades. Where the MIV does not meet the ILT, the MIP and MIV default to zero.

1.6 The current MIDS (effective from 18 April 2019, following the implementation of BSC Modification P377) sets the products to be included in each half-hourly price and volume calculation as the Half-Hour, 1 Hour, 2 Hour and 4 Hour products traded within eight hours of the Submission Deadline. Prior to BSC Modification P377, the products were required to be traded within 12 hours of Gate Closure.

1.7 Weightings are applied to reflect the importance of each product and timeband and are set to '1' or '0', which either completely include or exclude particular trades. The current weightings applied to the different products and timebands used in the calculations are shown in **Table 1.1**.

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Table 1.1 Product and Timeband Weightings

		Timeband											
	Product	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Half-Hour	**H**	1	1	1	1	1	0	0	0	0	0	0	0
1 Hour Block	**1**	1	1	1	1	1	0	0	0	0	0	0	0
2 Hour Block	**2**	1	1	1	1	1	0	0	0	0	0	0	0
4 Hour Block	**4**	1	1	1	1	1	0	0	0	0	0	0	0
Overnight	**O**	0	0	0	0	0	0	0	0	0	0	0	0
Peak	**P**	0	0	0	0	0	0	0	0	0	0	0	0
Extended Peak	**E**	0	0	0	0	0	0	0	0	0	0	0	0
Day Ahead Auction	**A**	0	0	0	0	0	0	0	0	0	0	0	0

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2. Use of the Market Index Price (MIP)

2.1 Since the introduction of BSC Modification P305 'Electricity Balancing Significant Code Review Developments', implemented on 5 November 2015, the MIP is used to set the System Price in two scenarios:

    a) When the Net Imbalance Volume (NIV) is zero, then the System Price will default to the MIP; or

    b) If all of the actions in the price stack are unpriced then the Replacement Price, and consequently the System Price, will be set by the MIP.

2.2 Prior to the implementation of BSC Modification P305, the 'reverse' System Price was calculated for every Settlement Period and used for Energy Imbalance Settlement. The aim of the 'reverse' price was to reflect the price of wholesale electricity in the short term market for Great Britain, with the MIP used to set the 'reverse' price.

2.3 The System Price has not defaulted to the MIP due to a zero NIV since the implementation of BSC Modification P305. Since 2001, the NIV has equalled zero three times: 5 September 2007, Settlement Period 8; 22 September 2009, Settlement Period 10; and 10 May 2015, Settlement Period 7.

2.4 **Graph 2.1** below shows the number of Settlement Periods with a Replacement Price over the past eight review periods. The Replacement Price is primarily determined based on the weighted average cost of the most expensive 1MWh of unflagged balancing actions, the Replacement Price Average Reference (RPAR). Where there are no unflagged balancing actions, the Replacement Price is set at the MIP.

2.5 The MIP set the Replacement Price in 554 Settlement Periods between 1 August 2019 and 31 July 2020. This represents 3.2% of all Settlement Periods, and 44.5% of Settlement Periods with a Replacement Price.

Graph 2.1 Annual incidences where the Replacement Price has been used in the System Price calculation. Annual periods are from 1 August to 31 July.
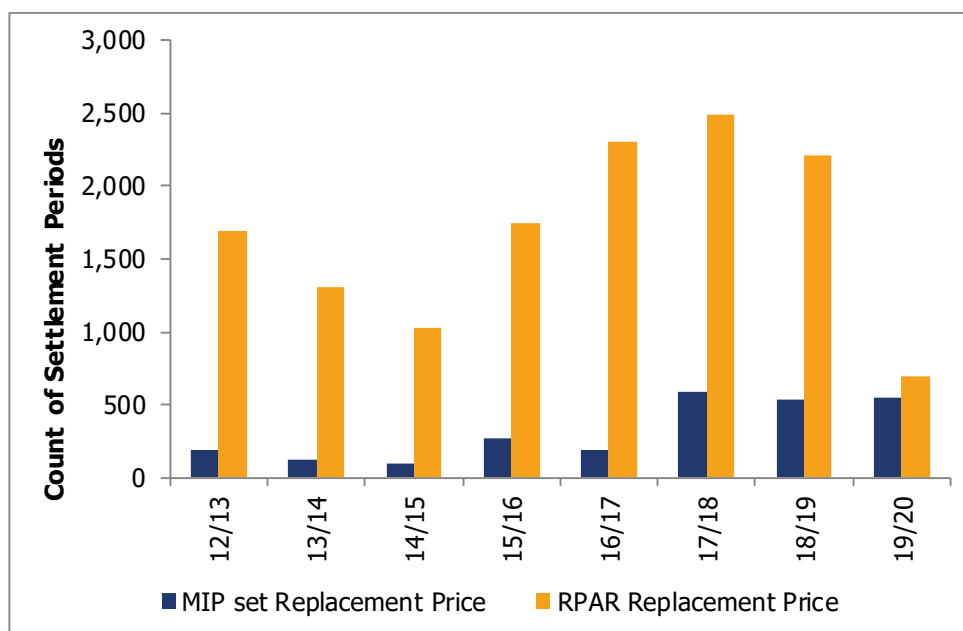

2.6 A 55% decrease in the number of Settlement Periods with a Replacement Price was seen since the last review. There was a 3% increase in the number of Settlement Periods with a MIP set Replacement Price and a 69% decrease in the number of Settlement Periods with a RPAR set Replacement Price.

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2.7   **Graph 2.2** shows the average of the MIP and the RPAR for the Settlement Periods where they have been used as the Replacement Price to set the System Price. Both the average MIP and RPAR Replacement Prices have decreased by £22.79/MWh (49%) and £24.56/MWh (58%) respectively. This is the largest decrease in the average MIP and RPAR Replacement Prices for the past eight reviews.

Graph 2.2 Average of the MIP and RPAR Replacement Prices. Annual periods are from 1 August to 31 July.
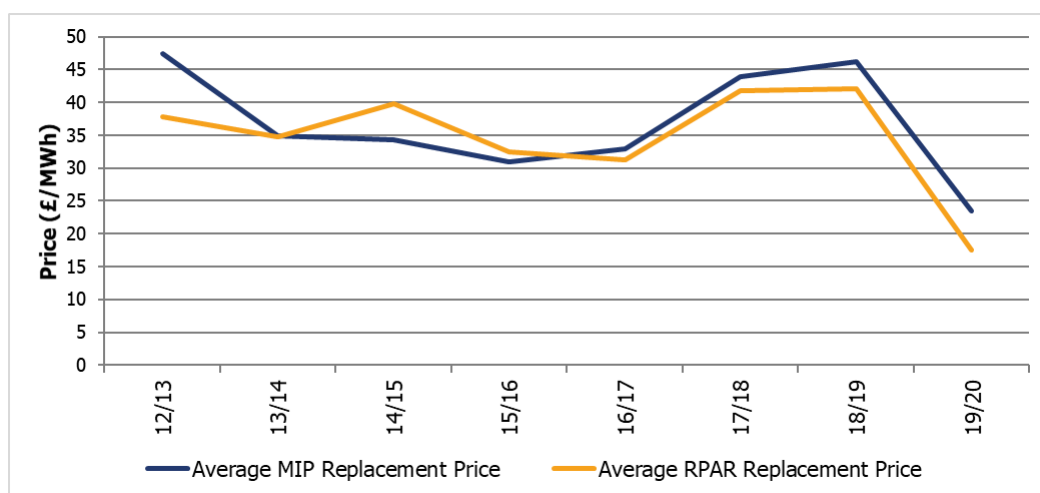
Future use of the MIP

2.8   The European Balancing Guideline (EBGL) requires all Transmission System Operators (TSOs) to develop a proposal for the harmonisation of imbalance settlement, including pricing. The proposal contains requirements for the calculation and use of a 'Value of Avoided Activation of Balancing Energy' (VOAA). This is the terminology that refers to a default price in situations where we currently default to the MIP.

2.9   The proposal includes a definition making it clear that this value can only be calculated from prices for balancing products, and therefore the MIP cannot be used. This is consistent with the overarching EBGL requirements. The proposal was approved on 15 July 2020, and the MIP must be replaced with a VOAA by 15 January 2021.

2.10   BSC Modification P410 'Changing imbalance price calculations to comply with the Imbalance Settlement Harmonisation regulations' will provide a calculation methodology for the VOAA in order to comply with the EBGL. After the initial Work Group, Elexon is investigating viable methodologies for calculating the VOAA to develop a default price to be used in situations when, currently, the MIP is used.

3. Analysis of the Market Index Volume (MIV)

3.1 Market Index Volume (MIV) is the total traded volume across the '1' weighted products and within '1' weighted timebands. The weightings are displayed in **Table 1.1.**

3.2 The daily average MIV was 1,109MWh in the 2019/20 review period. This is 96MWh higher than the daily average MIV of 1,013MWh between 18 April and 31 July 2019 in the last review period following the implementation of P377. Historical daily average MIV data can be found in **Table 3.1**.

Table 3.1 Daily Average MIV in MIDS Reviews since 2012

Review Period (Aug-Jul)	Daily Average MIV (MWh)
2012/13	603
2013/14	620
2014/15	693
2015/16	666
2016/17	680
2017/18	687
1 Aug 2018 – 17 Apr 2019 (pre- P377)	734
18 Apr 2019 – 31 Jul 2019 (post- P377)	1,013
2019/20	1,109

3.3 BSC Modification P377 changed the timeband reference in the MIDS from Gate Closure to Submission Deadline. This has meant that trades made after Gate Closure, but before the Submission Deadline are able to be included in the MIV calculation. Hence the daily average MIV has been higher since 18 April 2019.

3.4 **Graph 3.1** displays the daily average MIV throughout the review period. The MIV reached a peak on 17 January 2020 at 1,858MWh, compared with last year's peak of 1,474MWh in April 2019. The February 2020 monthly average was 1,279MWh; this was the highest monthly average in this year's review period.

Graph 3.1 Daily and Monthly Average Market Index Volume by Settlement Date

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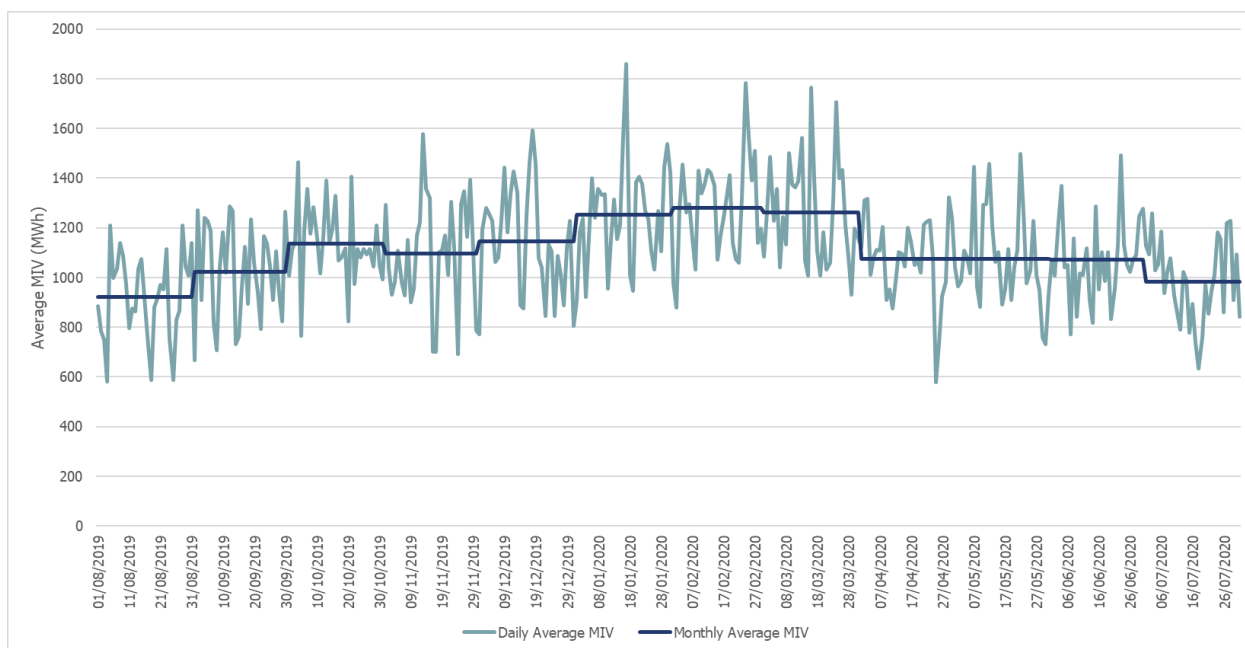
3.5   **Graph 3.2** shows the monthly average MIV for since January 2017. The orange line on **Graph 3.2** shows the implementation date for BSC Modification P377 (18 April 2019). Monthly average MIV can be seen to increase from this date due to the trades made between Gate Closure and the Submission Deadline now being included in the MIV. In the months since the implementation of P377, the monthly average MIV is 386MWh higher than the monthly average MIV prior to P377 since January 2017.

Graph 3.2 Historical monthly average Market Index Volume since 2017
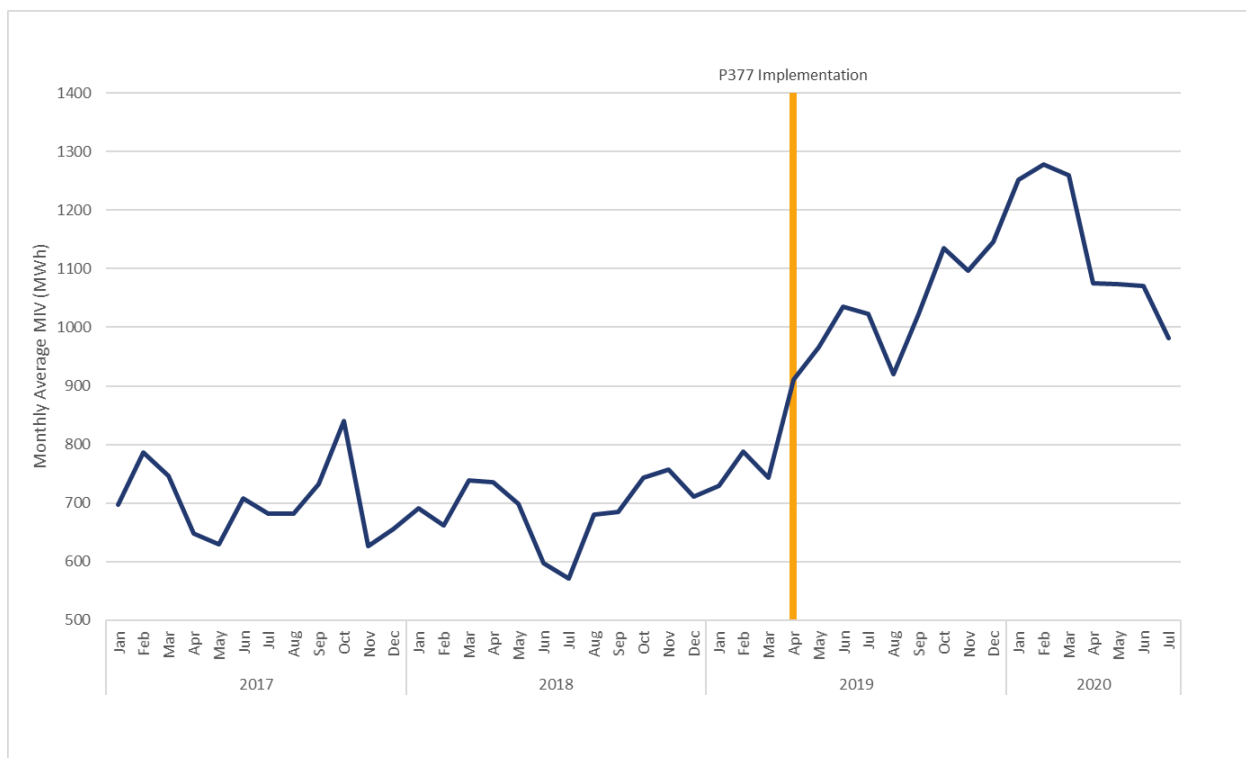
3.6   **Graph 3.3** shows the average MIV and average volume traded on each product weighted '1' by Settlement Period across between 1 August 2019 and 31 July 2020. Similar to the previous review, the Settlement Period average MIV is higher in the second half of the day.

3.7   Unlike the previous review the Half-Hour product does not have a clear peak within the standard 48 Settlement Periods. In 2018/19 the Half-Hour products peaked in Settlement Periods 14 and 46, with an average traded volume of 546MWh and 680MWh respectively. Settlement Periods 15 to 45 in the 2018/19 review had an average Half-Hour traded volume of 293MWh. In the current review period the Half-Hour product averages 603MWh across Settlement Periods 14 to 46.

3.8   During this review period, the 1-Hour Product was traded in all but two of the 48 standard Settlement Periods (45 and 46), with the highest average volume in Settlement Periods 9 and 10. In last year's review, the 1-Hour Product was traded during all Settlement Periods. **Graph 3.3** shows that the 1-Hour Product remains the least traded volume of all included products, which was also seen in the last review.

Graph 3.3 Average Market Index Volume by Settlement Period
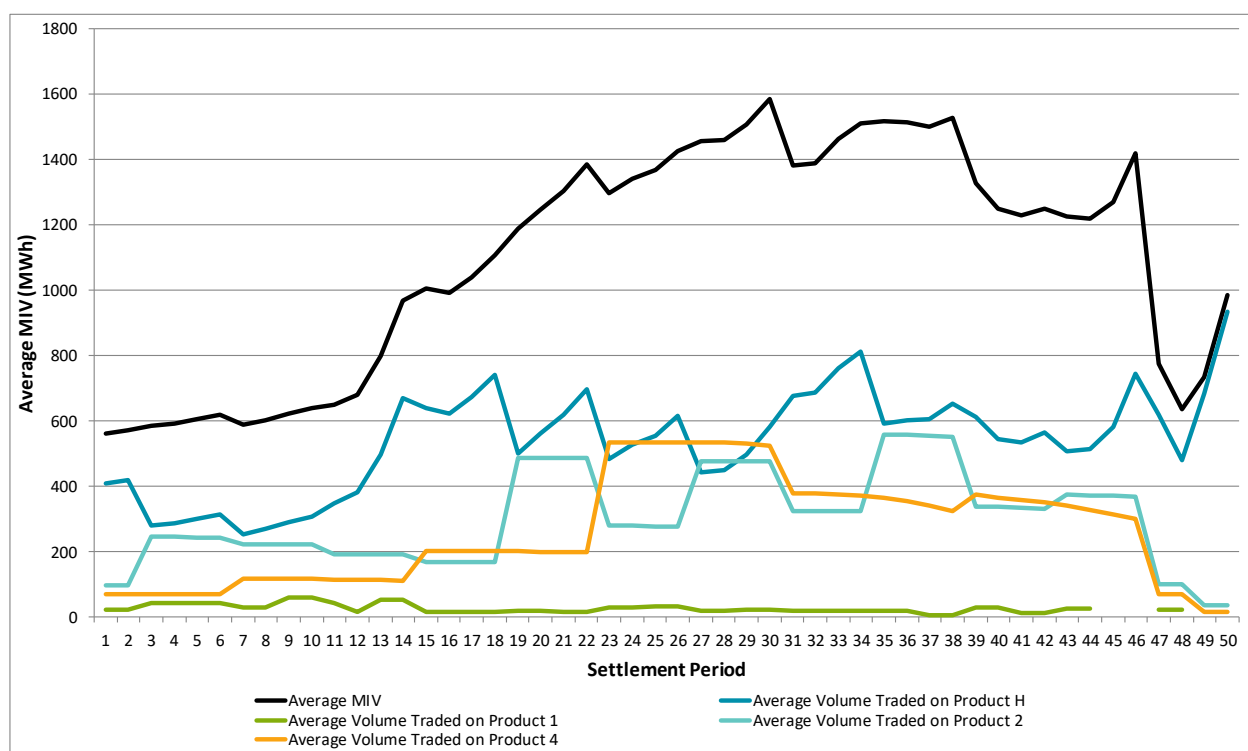
3.9   This section's analysis confirms the trend seen in the last review period, that the inclusion of trades up to the Submission Deadline following the implementation of P377 in April 2019 has significantly increased the MIV, with increased MIV seen through the whole 2019/20 review period. With sufficient MIV this suggests that the current weighted products and timebands are suitable and do not need to change.

4. Analysis of the Individual Liquidity Threshold (ILT)

4.1 Analysis has been carried out using the live products and timeband weightings specified in **Table 1.1.** Our analysis indicates that the current ILT is fit for purpose and that there should be no change to the value.

4.2 The ILT is currently set to 25MWh, and triggers a default rule when there is a low liquidity of trades in a Settlement Period. When the MIV is less than the threshold, both the MIP and MIV are defaulted to zero.

4.3 The ILT must be set in accordance with the MIDS principles. We have analysed historical data to consider each of the principles; those applied when setting the ILT are:

a) Individual Liquidity Thresholds should be set to the same value(s) for every Market Index Data Provider (MIDP);

b) Individual Liquidity Thresholds may be set to zero;

c) Individual Liquidity Thresholds may be set to different values for different Settlement Periods in the day and may vary by Season or Day Type;

d) Individual Liquidity Thresholds should be set based on the analysis of historical data;

e) Individual Liquidity Thresholds should be set at a level that minimises the likelihood that the Market Index Price will be set by a single trade; and

f) Individual Liquidity Thresholds should be set to ensure that the Market Index Price is defaulted in the minimum number of Settlement Periods, subject to the previous principle.

4.4 Currently the ILT for both MIDPs is 25MWh, so principle **a)** is met.

4.5 The analysis shows that the ILT could be set to zero as per principle **b)**, which would also meet principle **f)**. Analysis has been carried out by MIDP to show the difference an ILT of zero would have for the two MIDPs. There were 21 Settlement Periods (0.12%) in the current review for EPEX SPOT where the MIP and MIV were defaulted to zero. For 14 of these 22 Settlement Periods, no data was received from the MIDP. For Nord Pool, 17,438 Settlement Periods (99.26%) had the MIP and MIV defaulted to zero in the 2019/20 review period. For 17,392 of these Settlement Periods, there were no qualifying trades as part of the Market Index Base Data.

4.6 Reducing the ILT to zero would ensure all qualifying trades are included in the calculation of MIPs, and so reduce the number of occasions when the MIP is defaulted to zero to when there were no qualifying trades at all. However reducing the ILT to zero would also increase the likelihood that the MIP is set on a single trade and so go against principle **e)**.

4.7 In the current review period, zero Settlement Periods for EPEX SPOT had the MIP set based on a single trade. 23 Settlement Periods for Nord Pool had the MIP set by a single trade. Increasing the ILT increases the chances of the MIP defaulting to zero, which would be contrary to principle **f)**. Although the principles aim to avoid the price being set on a single trade, of the 23 instances for Nord Pool which have occurred within the last year, 19 of these were on the ILT boundary of 25MWh.

4.8 **Table 4.1** Displays a breakdown of the number of Settlement Periods based on the MIV, whether there was more than one trade, and if the MIV was below the ILT threshold for each MIDP. Settlement Periods below the ILT threshold, which defaulted the MIP and MIV for the MIDP are shown by the orange shaded cells. The number of defaulted Settlement Periods for EPEX SPOT can be seen to have reduced following the implementation of P377 with 21 Settlement Periods defaulted in this review compared to 40 across the 2018/19 review. Review periods listed run from 1 August to 31 July.

Table 4.1(a) Breakdown of MIV for EPEX SPOT in the last four MIDS reviews. The Settlement Periods defaulted with a MIV below the ILT are displayed by the shaded orange cells.

| Market Index Volume (MWh)	0	0-25		25-100		Above 100	Settlement Periods with Market Index Data	Total Settlement Periods in review period
Count of Trades	0	1	Greater than 1	1	Greater than 1	Greater than 1		
2016/17	14	2	4	2	65	17,433	17,506	17,520
2017/18	24	12	28	7	312	17,137	17,496	17,520
1 Aug 2018 - 17 Apr 2019 (pre-P377)	22	16	11	3	253	12,175	12,458	12,480
18 Apr 2019 - 31 Jul 2019 (post-P377)	1	0	0	0	2	5,037	5,039	5,040
2019/20	14	0	7	0	15	17,532	17,554	17,568

(b) Breakdown of MIV for Nord Pool in the last four MIDS reviews. The Settlement Periods defaulted with a MIV below the ILT are displayed by the shaded orange cells.

Market Index Volume (MWh)	0	0-25		25-100		Above 100	Settlement Periods with Market Index Data	Total Settlement Periods in review period
Count of Trades	0	1	Greater than 1	1	Greater than 1	Greater than 1		
2016/17	17,459	17	2	21	17	4	61	17,520
2017/18	17,421	19	4	20	46	10	99	17,520
1 Aug 2018 - 17 Apr 2019 (pre-P377)	12,384	23	6	23	44	0	96	12,480
18 Apr 2019 - 31 Jul 2019 (post-P377)	5,034	2	0	2	2	0	6	5,040
2019/20	17,392	41	5	23	61	46	176	17,568

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4.9   **Graph 4.1** displays the data from Table 4.1 for each MIDP where the MIV is greater than zero, but less than 100MWh. The graph shows the Settlement Periods which had a MIV below the ILT with the red outlined box. There were no Settlement Periods for EPEX SPOT where there was only a single qualifying trade. Of the 17,554 Settlement Periods in which Market Index Data was received by the MIDP, only 22 (0.13%) of these had a MIV less than 100MWh.

Graph 4.1 Non-zero MIV less than 100MWh for each MIDP, split by if the MIV was set by more than one trade or not. The ILT is shown by the red outlined box.
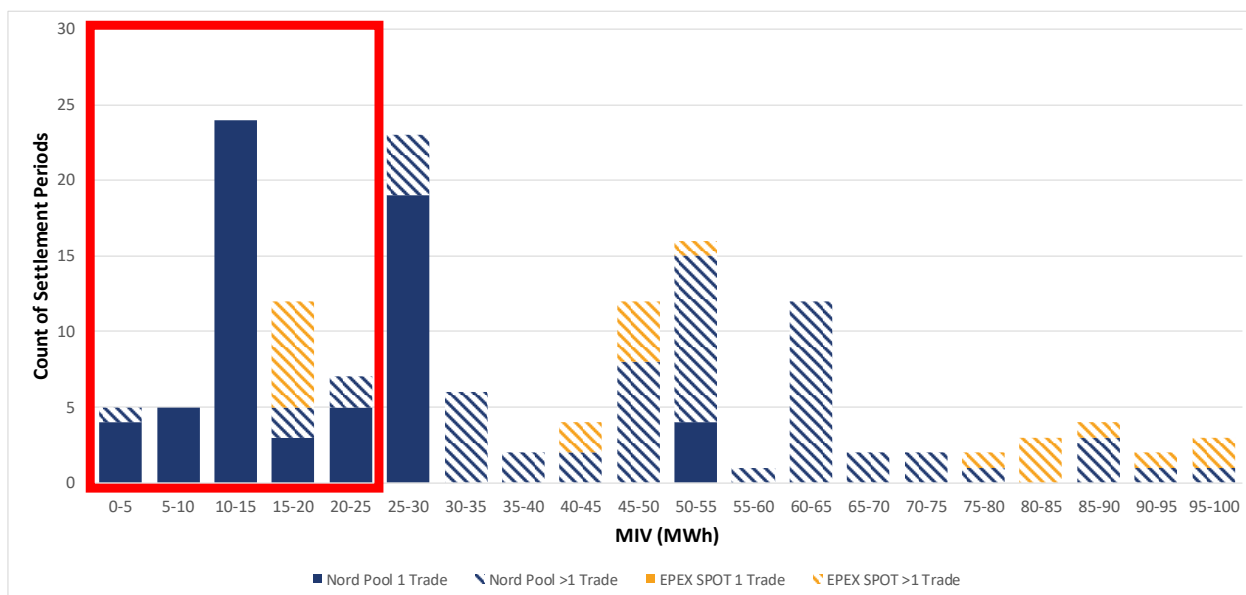
4.10   The analysis in this section shows that the ILT could be changed to zero, but based on principle **a)**, the ILT should be the same for both MIDPs. Table 4.1, shows the differences in the MIV for each MIDP. With no Market Index Data received due to no qualifying trades from Nord Pool for a vast majority of Settlement Periods, changing the ILT from 25MWh to zero would have little impact in helping to aid principle **f)**. Of the 46 Settlement Periods below the ILT for Nord Pool, 41 of these had the MIV set by a single trade, so any reduction in the ILT would be contrary to principle **e)** which states Settlement Periods where the MIP is set by a single trade should be minimised.

4.11   Based on the analysis we are proposing no change to the current ILT of 25MWh.

5.   Analysis of the Timeband and Product Weightings

5.1   The analysis was carried out using the '1' weighted products and timebands specified in the current version of the MIDS, which are shown in **Table 1.1**.

5.2   The timeband and product weightings determine which trades are included in the MIP and MIV calculation. Like the ILT, the timeband and product weightings are set in accordance with a set of principles detailed in the MIDS.

5.3   The principles are:

a)   Weightings should be applied to the components that make up the Market Index Price;

b)   Weightings should not be applied to the Market Index Volume and should not be used in determining whether the traded volume meets the Liquidity Threshold for the half hour;

c)   Weightings may be applied to reflect how close to real time a trade was made (timeband weighting);

d)   Weightings may be applied to the product or contract types which qualify in the index calculation (i.e. those which are traded in the short term as defined in the BSC);

e)   The same weightings must be applied to equivalent qualifying products and timebands across all Market Index Data Providers;

f)   Weightings may be set to ensure that the Market Index Price is reflective of the price of trades as close as possible to the Submission Deadline;

g)   Weightings may be set to minimise the flattening effect on the Market Index Price of including traded products used in the methodology that have one price for a time period longer than one Settlement Period;

h)   Weightings may take values from '0' to '1'; and

i)   Where a weighting is set to '0', the weighting is effectively null, trades in the related product type and timeband will be excluded from the Market Index Volume (and Price) calculation.

5.4   A number of the principles - **a), b), c), d), e), h)** and **i) -** are already met under the current operation. The remaining principles **f)** and **g)** are considered below.

5.5   The MIDP calculates the MIP using the weighted products and timebands when the MIV is above the 25MWh ILT. The '1' weighting is currently applied to products H, 1, 2 and 4 in timebands 1 to 5, which results in trades relating to these product and timeband combinations being used to calculate the MIP and MIV.
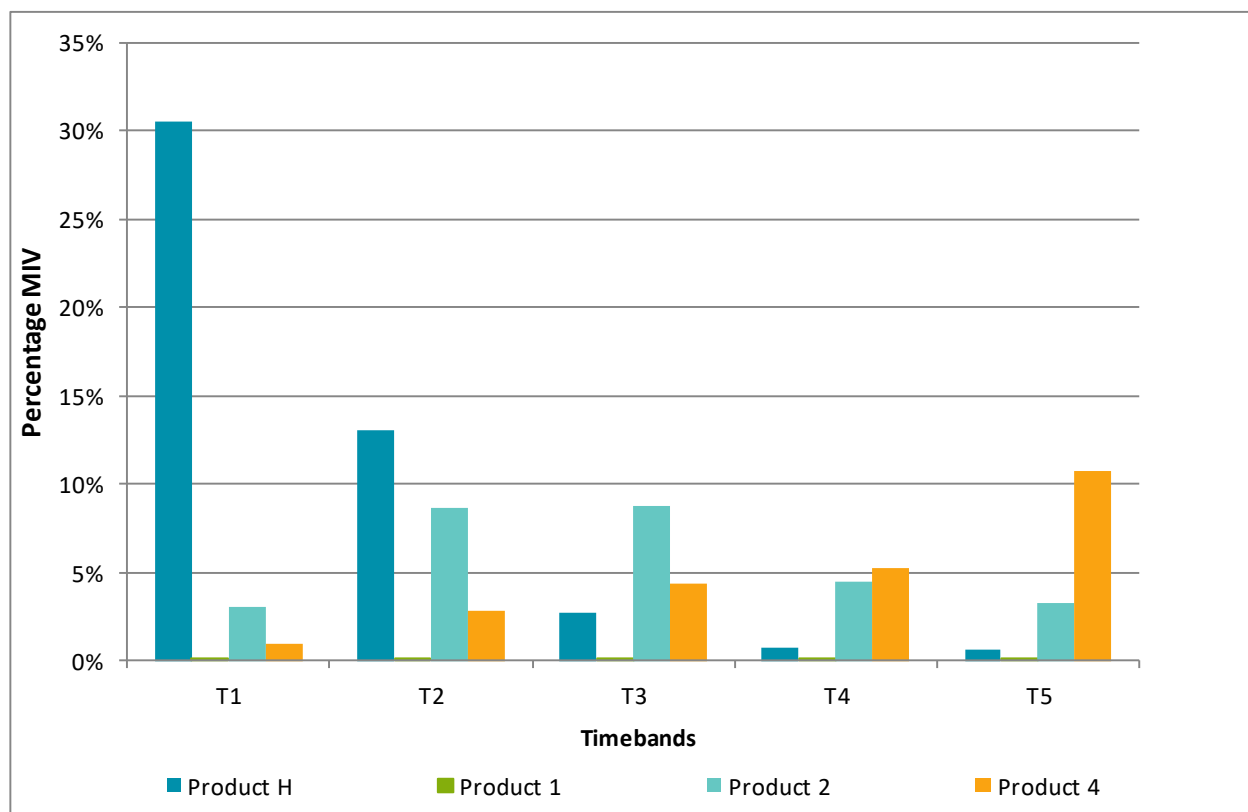
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5.6   **Graph 5.1** shows the percentage of traded volume on the '1' weighted products captured in the '1' weighted timebands. As expected, due to the nature of the products:

    −   The volume traded on the Half-Hour Product was highest in timebands 1 and 2;

    −   The volume traded on the 2-Hour Product was mainly captured in timebands 2 and 3; and

    −   Traded volume on the 4-Hour Product was mainly dominating in timeband 5.

It is worth noting that timeband 5 is four hours duration compared to 1 to 4 which are only one hour in duration. The volume traded on the 1-Hour Product is typically low.
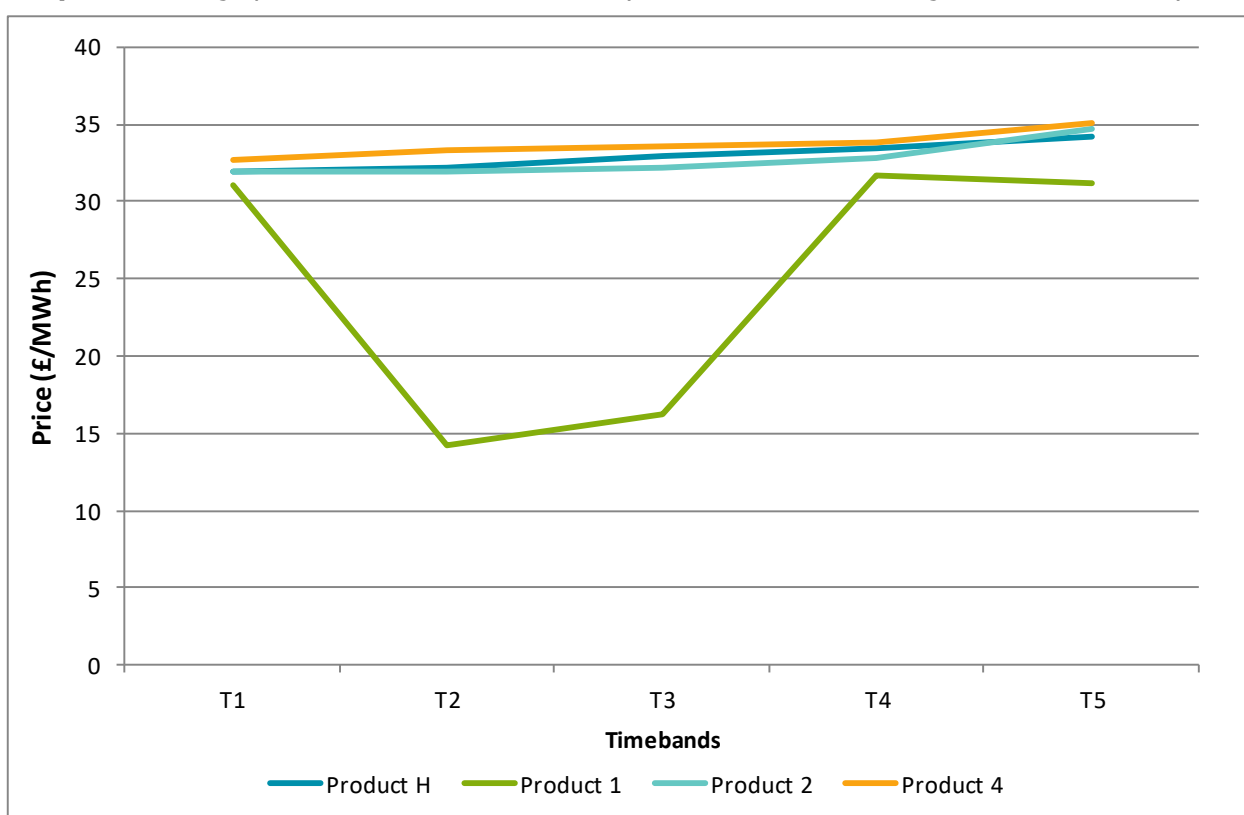
Graph 5.1 Average percentage of Market Index Volume by timeband between 1 August 2019 and 31 July 2020

5.7   **Graph 5.2** shows the price curve for the '1' weighted products in each timeband. The average price was decreased slightly from timeband 5 towards the Submission Deadline (from right to left) for the Half-Hour 2-Hour and 4-Hour Products. Average prices for the Half-Hour Product decreased by £2.25/MWh, from £34.22/MWh in timeband 5 to £31.97MWh in timeband 1. Average timeband prices for the 2-Hour Product decreased by £2.79/MWh and for the 4-Hour Product by £2.42/MWh from timeband 5 to timeband 1. The average price for the 1-Hour Product varies more than the other three products. However, there are a lower number of trades on this product, less than 0.02% of all volume traded over the five timebands. This shows that the MIP is not distorted by one to the weighted products or timebands, and therefore that the current weighted products and timebands remain suitable.
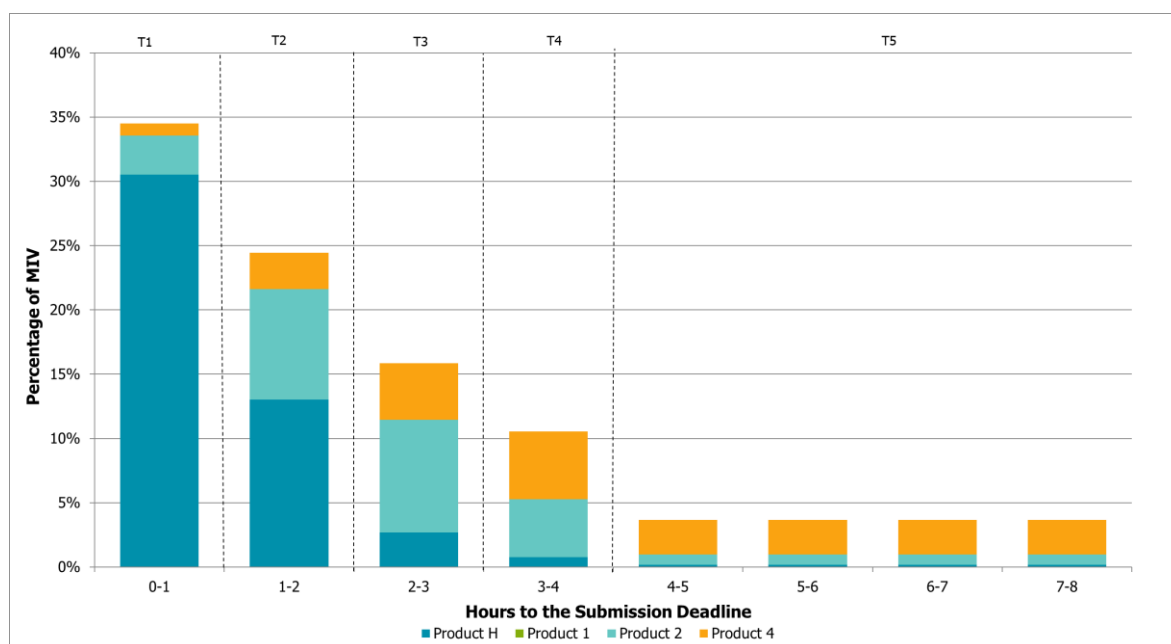
Graph 5.2 Average price of Market Index Volume by timeband between 1 August 2019 and 31 July 2020

5.8   **Graph 5.3** displays the same information as **Graph 5.1**, but with the x-axis set to an hourly scale. The volumes for the longer timeband 5 are averaged out across each of the four hours. As seen in the previous graph, the respective products percentage of MIV peaks when they are closest to the Submission Deadline. With the Half-Hour Product peaking in the hour before the Submission Deadline, the 2-Hour Product peaking two to three hours before the Submission Deadline and so forth. Trades made within four hours of a Settlement Period (timebands 1 to 4) make up 85% of the MIV.

Graph 5.3 Percentage of Market Index Volume by Time (hours) to the Submission Deadline, 1 August 2019 and 31 July 2020

6.   Analysis of all Products and Timebands

6.1   Analysis of all timebands and products for potential changes on current weightings

6.1.1   All of the MIDS Products are detailed in **Table 6.1.1**. The analysis considers all of the products listed below **except for the Day Ahead Auction Product** (Product A), which is considered separately as the volume traded on this product is significantly larger than the other products.
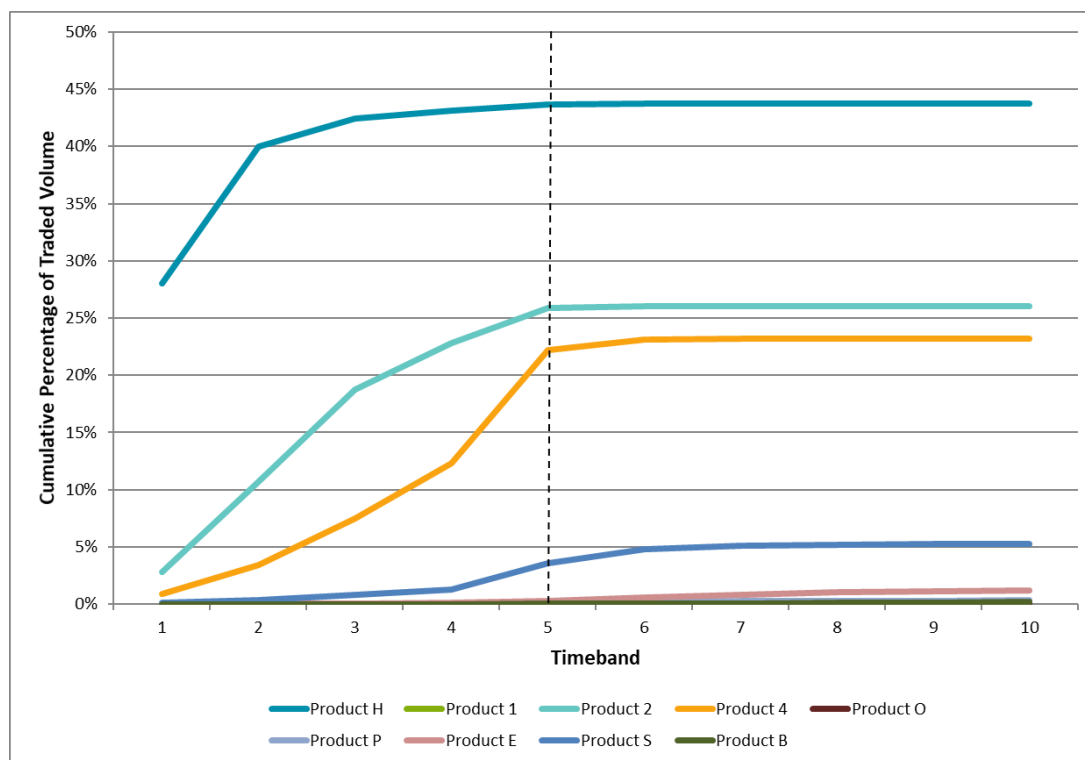
Table 6.1.1. Available Products

Product	Identifier	Duration (hours)
Half-Hour	H	0.5
1 Hour Block	1	1
2 Hour Block	2	2
4 Hour Block	4	4
Overnight	O	8
Peak	P	12
Extended Peak	E	16
Block 3 and 4	S	8
Off Peak	N	8
Base Day	B	24
Day Ahead Auction	A	1

6.1.2   We have reviewed data for the two Market Index Data Providers' trades up to three Calendar Days ahead of the Submission Deadline and this period is broken down into 12 timebands. Timebands 1-5 which cover trades made up to 8 hours ahead of the Submission Deadline. We will now consider timebands 1-12 to confirm the relevance of the current weightings. Note that zero trades were made in timebands 11 and 12 during the review period.

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6.1.3 **Graph 6.1.1** shows the cumulative percentage of volume traded on all products (except Product A) in all timebands between 1 August 2019 and 31 July 2020. In the earlier timebands, a much higher percentage of volume is traded on products H, 2 and 4 than any other products. This suggests that the current products remain suitable as they are traded close to the Submission Deadline (principle **f)**) and represent a significant percentage of the total volume.
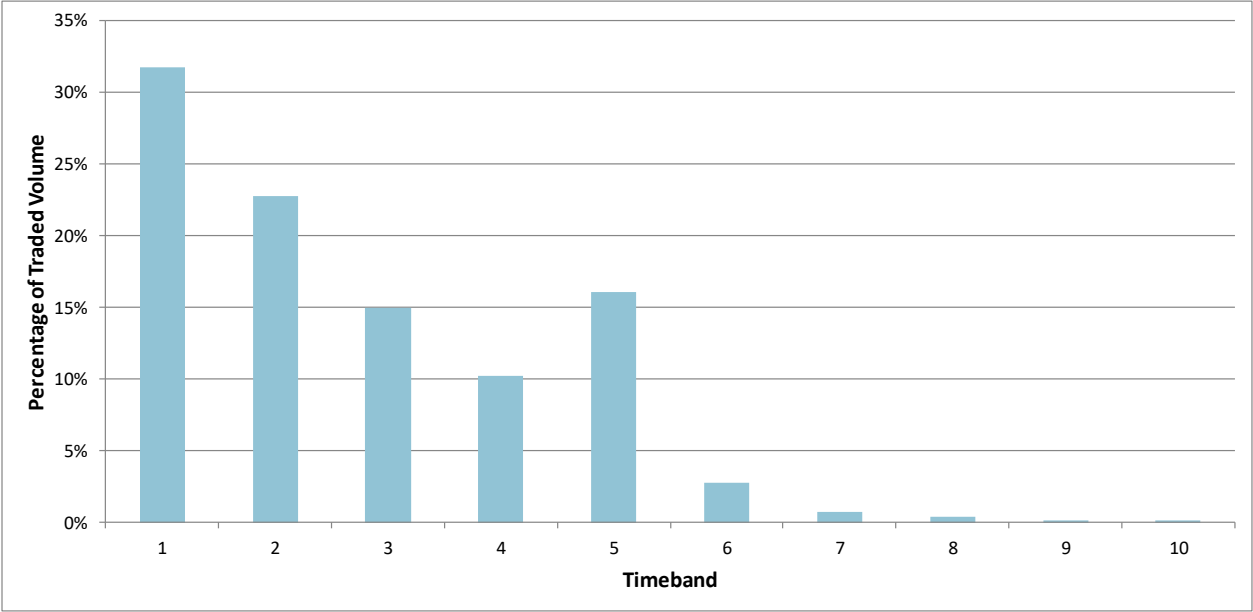
Graph 6.1.1. Cumulative Percentage of Total Trade Volume on all Products (excluding Product A) across all timebands between 1 August 2019 and 31 July 2020

6.1.4 **Graph 6.1.2** shows the percentage of total volume traded in each timeband. The largest volumes were traded at timeband 1 (accounting for 31.8% of the total trade). 54.5% of all volume (excluding Product A) is now traded within two hours of a Settlement Period. Without Product A, 95.8% of the volume from the other products are traded with the weighted timebands, which represent 0-8 hours prior to the start of a Settlement Period.

Graph 6.1.2. Percentage of total volume traded (excluding Product A) in each timeband between 1 August 2019 and 31 July 2020
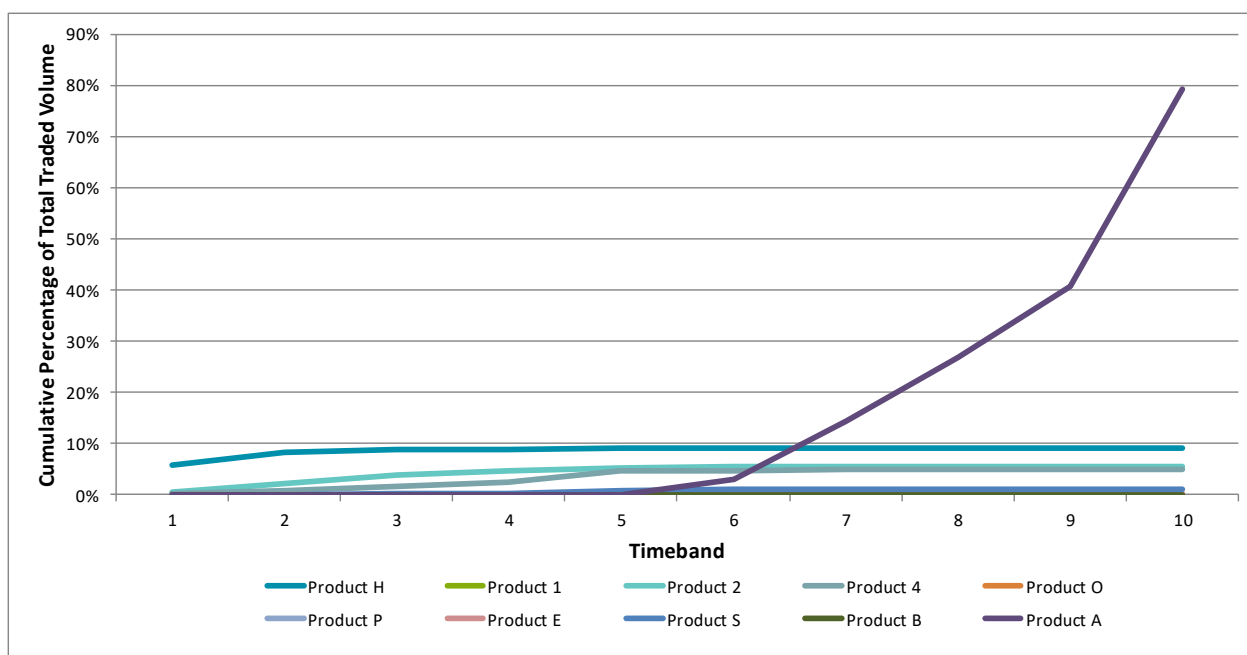
6.2   Day Ahead Auction Product

6.2.1   The Day Ahead Auction Product (Product A) is a blind auction where buyers and sellers enter anonymous orders for each hourly period from 23:00 that evening to 23:00 the next day. The auction market closes at 11:00, after which the orders are matched for each hourly period. The time that the orders are matched gives the trade time used in calculating the timeband for the trade.

6.2.2   **Graph 6.2.1** shows that the Auction Product accounted for 79.3% of total traded volume during in the review period. The product only applies from timeband 6 (more than 8 hours before a Settlement Period). Unlike the other products this product is not traded in the weighted timebands 1 to 5 that are closer to the Submission Deadline. During the 2018/19 review period, the Auction Product accounted for 79.7% of total traded volume.

6.2.3   The Auction Product has been given '0' weighting and the ISG recommended that this product should be monitored considering its large traded volume on the market.

6.2.4   Considering the current market liquidity, which has increased following the implementation of BSC Modification P377 in April 2019, and weighting principle **f)**, the current '0' weighting on the Auction Product remains suitable.

Graph 6.2.1. Cumulative Percentage of total traded volume on all Products (including A) across all timebands between 1 August 2019 and 31 July 2020

6.2.5 **Table 6.2.1** shows the total traded volume on all products across all timebands. As displayed in **Graph 6.2.1**, Product A accounts for most of the traded products, and a large proportion of all trades (38.44%) is made during timeband 10 driven by Product A (accounting for 38.42% of all trades at timeband 10). The percentage of volume for Product H has increased to 9.07% in the current review period, up from 7.72% in the 2018/19 review after the implementation of P377 (18 April to 31 July 2019), and 2.51% in the 2018/19 review prior to P377 (1 August 2018 to 17 April 2019).

Table 6.2.1 Percentage of Total Traded Volume on all Products across all timebands between 1 August 2019 and 31 July 2020

Products	Timeband										Total
	1	2	3	4	5	6	7	8	9	10	
H	5.80%	2.48%	0.51%	0.15%	0.12%	0.01%	0.00%	0.00%	0.00%	0.00%	**9.07%**
1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**
2	0.58%	1.63%	1.67%	0.85%	0.63%	0.03%	0.00%	0.00%	0.00%	0.00%	**5.39%**
4	0.18%	0.54%	0.83%	1.00%	2.04%	0.20%	0.02%	0.00%	0.00%	0.00%	**4.82%**
O	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**
P	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.01%	0.01%	0.00%	0.00%	**0.07%**
E	0.00%	0.00%	0.01%	0.01%	0.04%	0.05%	0.06%	0.04%	0.02%	0.01%	**0.25%**
S	0.02%	0.06%	0.09%	0.10%	0.48%	0.25%	0.06%	0.02%	0.01%	0.00%	**1.09%**
B	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	**0.04%**
A	0.00%	0.00%	0.00%	0.00%	0.00%	2.95%	11.49%	12.31%	14.10%	38.42%	**79.27%**
Total	6.58%	4.72%	3.11%	2.12%	3.33%	3.53%	11.65%	12.39%	14.14%	38.44%	**100.00%**